FORT DETRICK:

In Search Of A Biolo

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By Richard

Biological warfare—as well as chemical warfare—can have three main objectives. In its mildest form, it can act as an harassing agent—as does tear gas, for instance. In a stronger form, it can be used as an incapacitating agent, either making the enemy temporarily sick with vomiting or diarrhea, or a mild dose of a particular disease. These effects will eventually wear off. In its most virulent form, of course, there is the strongest intent of all. An attack with an extremely virulent microorganism has one and only one function—to bring severe illness or death to its victims.

Today, as things stand here in America, a successful enemy attack from any one of these three classes of agents could not be detected in time to send out a timely warning to the populace. Our first knowledge of an attack would either be through obvious physical manifestations (such as fever or a runny nose), or the more serious symptoms brought on by germs carrying infectious diseases.

However, it is encouraging to learn that in the past few years the scientists and researchers at Fort Detrick have been working diligently and strenuously on an alarm system that will, in time—when it is properly tested and made functional—not only sound an alarm or issue a warning signal to an army or to the responsible national authorities, but eventually will be perfected to the point where it will actually provide information to permit some classification of the type of a disease-producing microorganism that is being utilized by the enemy in the attack. However, this particular improvement lies in the hopeful future.

Out of the 90 billion dollars that Congress appropriated last year to the Department of Defense, approximately 20 million was the sum allotted to biological research and development. Of the meticulous research that is being done at Detrick, approximately 25 per cent of all their efforts are devoted to the perfection of this alarm system. And—a fact that is worth keeping in mind—this is the only alarm system that currently is being experimented upon and being made feasible to use in the United States today. The scientists and researchers at Detrick are the only ones who know what it is they are defending this country against, as far as bacteriological warfare is concerned.

"Right now," Colonel Gershater, Fort Detrick's Post Commander, tells me, "our automatic alarm program has top priority here. The alarm is a sensitive instrument that automates a complex biochemical process and enables the device to detect hazardous concentrations of any harmful germ in the air in time to give warning. If it were used on a battlefield, for instance, or in a city, the device would draw in a sample of air and determine if a hazardous aerosol is present. And you can believe me when I say that this is an extremely complex technical project.

I do believe him.

One of the main criticisms directed against biological warfare, and consequently against Fort Detrick's research by some critics has always been that not only do they conduct programs on how to save human lives by immunization and other defensive measures, but they also have the know-how to cause the very diseases they are attempting to immunize people against. Nowhere does this need for both an offensive capability and defensive means become more apparent as an indispensable necessity than when an alarm system is being discussed.

"You have to understand," says Colonel Gershater carefully, "that a good defense cannot be designed unless we understand exactly what it is we are defending ourselves against. You can imagine how difficult it would be to try to detect, in a timely man-

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gical Alarm System

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ner extremely small amounts of biological material in an aerosol. It is an extraordinarily complex and difficult technical problem! For instance, say you come down with a natural infection. You become ill, say you've caught the flu. Well, you go to your doctor and you tell him how you feel. Your bones ache. Your eyes burn. You have a fever. He'll ask you all kinds of questions, and it it's serious enough, he may even take some blood samples from you. You know as well as I do that before you can find out what it is you've caught, at least one or two days will have passed, in all probability, before he can give you a confirmed diagnosis.

"Now, let's think of what would happen in an attack," he says energetically (Colonel Gershater can become quite intense when he is describing something.) "During an attack, what we need is some sort of instrument that will be sampling the air continuously. It will be 'sniffing' air samples in strategic locations. And just think of the job it would have to do. It would have to be able to distinguish among dust, pollen, air pollution from smoke, and carbon dioxide. It would have to sift all of this background material, identifying each one as not being harmful, yet at the same time, it would have to be watchful for the first sign of bacterium or other microorganism that is harmful. Once that harmful bacterium or other microorganism is identified, the instrument would have to provide some sort of alarm. As it is now, we don't yet have that effective an instrument. We are currently concentrating our efforts on an alarm system that will notify us promptly of the presence of harmful microorganisms in the air."

He stops in the middle of the office. "So you can see what we are really searching for. We are searching for a very reliable instrument that will have a very low false-alarm rate and the ability to provide timely warning to downwind personnel, so that they can at least be able to put on their gas masks and take cover inside until the attack is over. In order for our scientists and researchers to be able to accomplish this task, they must be able to learn how to challenge these instruments under controlled conditions with representative microorganism samples. They have to ask themselves: What would the enemy be able to use against us? How would we be able to identify it? As you can see, this is an enormously complex task. The enemy can employ viruses, rickettsiae, bacteria, fungi, and even toxins of bacterial origin that are generally considered to be potential agents for use against man. So that's why our scientists and researchers must continually think in terms of offensive possibilities, because we must have the imagination and technical knowledge of trying to outguess the enemy's intent. We know from our own research what we have discovered. There isn't any valid reason for us to doubt that if we have found out certain biological facts, the enemy has done so as well."

Mr. Donald Falconer, Director of Commodity Development and Engineering Laboratories at Fort Detrick, discussed the instument as follows. "The instrument itself," he says, "literally breathes in a volume of air. All the contents in the air are forced into a small liquid stream, then processed through a series of both chemical and physical steps which should detect both the absence of dangerous concentrations of microorganisms in the air, as well as their presence."

What happens if microorganisms are detected? "If they are

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present in the air," he explains, "a light might go on, or a sound alarm given."

I asked Mr. Falconer about the size and shape of the instrument. "Well," he said with a smile on his lips, "its weight is close to 75 pounds, and at this stage, it can be carried by two men. As you can see, it is the size of a two-suiter suitcase. It will be designed to run on batteries."

It is hoped that once the alarm system is perfected, these detectors can be set up geographically, for instance, in a war zone, ahead of the troops. As a mass of air carrying the bacteria heads in the direction of the troops, the detectors will be the first to be touched by the dangerous air, and will sound the alarm. Detectors will also be utilized around cities in the same way, but no doubt, by that time, they will be more reliable in their response.

"You see," says Falconer, "in a biological attack there isn't any smell, there isn't any taste, and you can't even feel it happening to you. You won't have any indication in the least that you are being subjected to an attack, unless, of course, you have a detector that can sound the alarm. Unlike the ABM program, our alarm is a passive alarm. It will not send up any missile to confront the oncoming missile that's in the air. Of course, what we have high hopes for in the future is being able to have the detector not only give a warning, but also be able to tells us what agents in particular it is giving us a warning about."

Dr. Benjamin Warshowsky, who is the systems manager for this project, comes in and explains how the system will work. "At this time," he says seriously, "we have highly trained scientists and technicians working on the alarm. They are trying to find a way of doing reliabily in minutes what would otherwise take hours, days and maybe even weeks to do."

"You realize," says Falconer quietly, "that virtually the total knowledge of biological warfare and defense in the United States today is concentrated here at Detrick."

"May I see the alarm you are working on?" I ask, feeling more certain that I would not be allowed to. I was quite surprised to hear that I could. Doctor Warshowsky offered to take me over to the lab, where the alarm system was being worked upon.

Indeed, like Mr. Falconer had said, the alarm did look exactly like a plastic two-suiter suitcase and it had a handle. The instrument itself was connected to a square plastic cage in which various bacteria and viruses, during an experiment, are released so that the alarm could pick out of the air the high concentration that might be in it. The air is literally pulled into the machine, much like a vacuum cleaner sucks in air, the the bacteria or virus are then incorporated into a liquid form, then drops down inside the system.

Should there be a high concentration of harmful bacteria in the air, there will be a chemical reaction inside the machine, which causes the production of a measureable amount of light. It is this illumination which finally sets off the alarm system, while at the same time, there is an electronic device, similar to those we see used on cardiograph machines, which also registers the presence of a high concentration of harmful bacteria by causing the arm to zig zag frantically across the graph sheets.

"How near are you to completion?" I asked Doctor Warshowsky.

He shruggs his shoulders. "You're looking at the results of a lot of mistakes, a lot of failures, and a few successes. We don't know at this time how much further we will have to go yet."

It is baffling to these scientists and researchers and directors that there is apparently Congressional consideration of abandoning biological warfare research while continuing chemical warfare research, on the grounds that the latter is a more tactically useful system, as Congressman Richard McCarthy has said. These men feel that the importance of their work to the national defense posture is not fully recognized, and there can be little question that morale has been shaken to a degree.

As Charles L. Crum, Deputy Director of Analytical Sciences Directorate, has said to me, "We have the top scientists in America today working here at Detrick. Yet, there was a news release recently which stated that a recent Nobel Prize winning scientist said that the scientists who worked here at Detrick were not competent. Later, another version of his remarks came out. What he had apparently said was that we were 'frighteningly competent.' But no one ever specifically retracted that first remark. Things are difficult enough for us as it is. We are suspect, and we have difficulties in being able to exchange knowledge with other scientists elsewhere in America or in the world. There are many who are reluctant to talk with us because they are afraid of getting mixed up in classified information."

After leaving Detrick that particular day, the words of Mr. Donald Falconer haunted me. "Virtually the total knowledge of biological warfare and defense in the United States today is concentrated here at Fort Detrick."

Yet, there is apparently some possibility of the biological warfare research program being closed down. If Detrick is closed down, and bacteriological warfare research abandoned in America, there is certainly every possibility that the alarm system that is currently being developed there will go down the drain, together with the rest of the program.

Can we realistically afford this loss, I wonder? Can a prudent nation do that to itself in today's world?

(Part IV, The Reality and Defense Against Biological Warfare, will appear on Nov. 13.)